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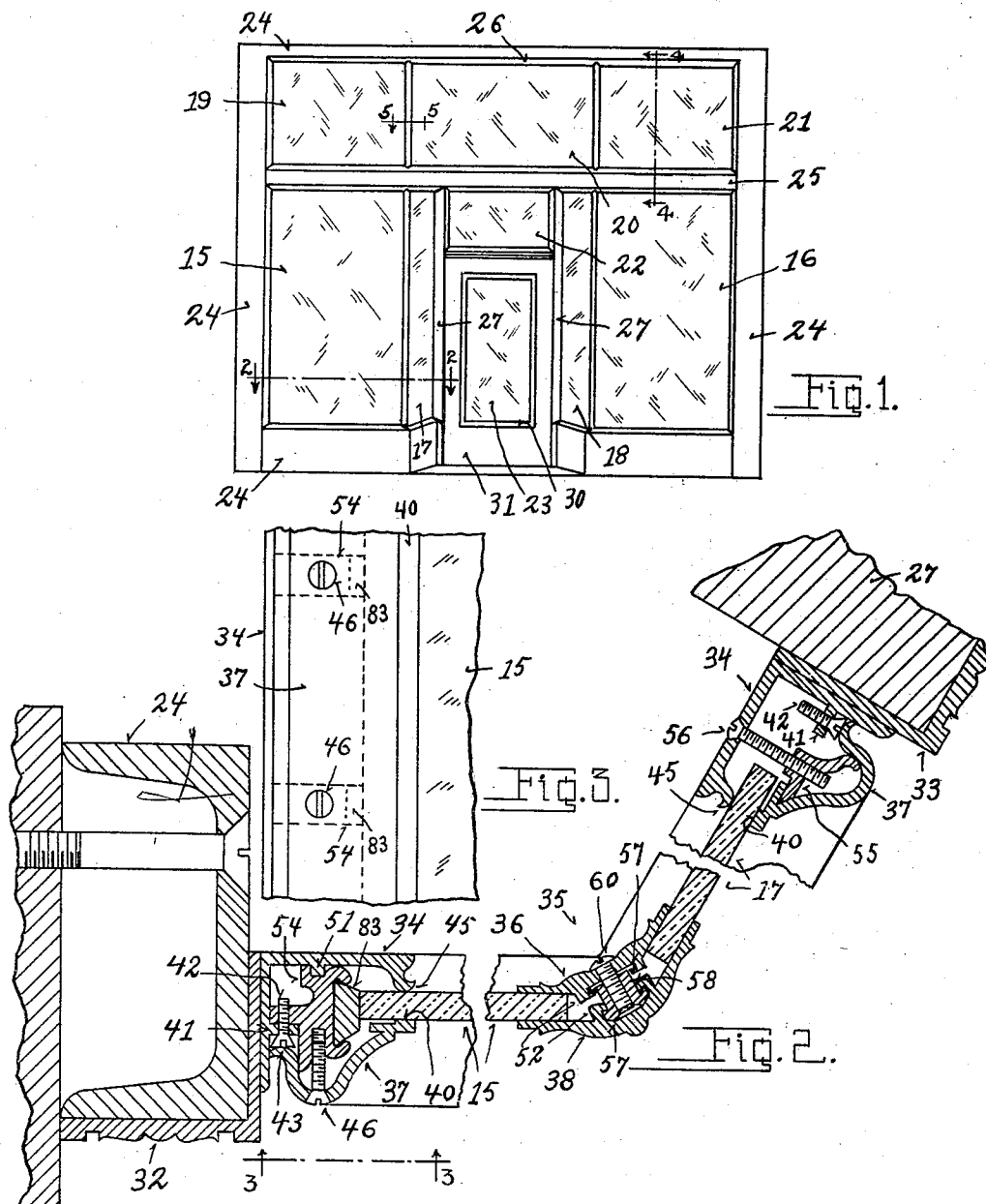
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1,793,503

WINDOW SASH

Filed March 20, 1928

2 Sheets-Sheet 1



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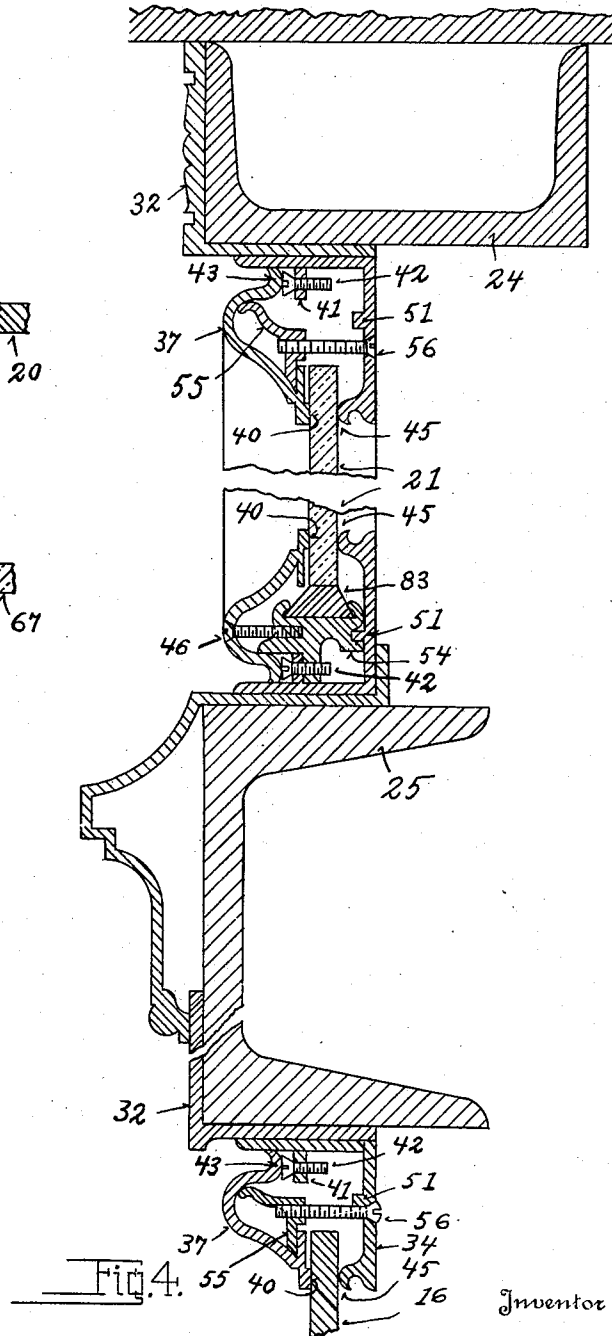
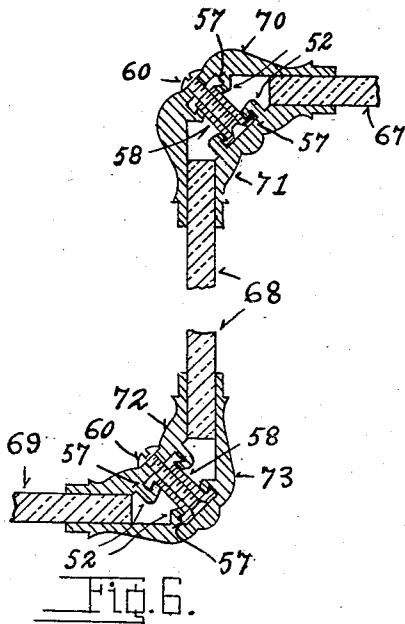
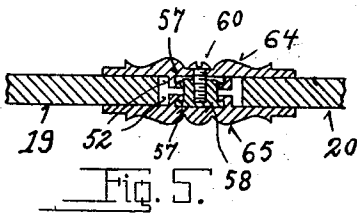
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WINDOW SASH

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UNITED STATES PATENT OFFICE

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WINDOW SASH

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My invention relates to improvements in metal sashes for windows, store fronts, and similar purposes. One of its objects is to provide an improved metal sash either stationary or movable, adapted to be adjusted in a plurality of sections into relation to the glass so as to afford substantially uniform contact and support for the glass. Another object is to provide improved means to relatively adjust the sash sections so as to uniformly distribute the engagement and pressure of the sash upon the glass panel supported thereby. Another object is to provide improved means to support the weight of the glass panel upon the edge of the panel and relative to the sash. Another object is to provide improved means for supporting a plurality of glass panels relatively in one sash structure. Another object is to provide improved means to support a plurality of glass panels at relatively different angles in one sash structure. My invention also comprises certain details of form and arrangement and combination of components, all of which will be fully set forth in the description of the accompanying drawings, in which:

Fig. 1 is a front elevation of a store front illustrating sashes embodying my improvements.

Fig. 2 is an enlarged sectional detail taken on line 2—2 of Fig. 1.

Fig. 3 is a detail in front elevation of a portion of the sash of Fig. 2, taken from the viewpoint 3—3 of Fig. 2.

Fig. 4 is an enlarged sectional detail taken on line 4—4 of Fig. 1.

Fig. 5 is an enlarged sectional detail taken on line 5—5 of Fig. 1.

Fig. 6 is a sectional detail similar to that shown in Fig. 2, illustrating a modification thereof in which the bends are at substantially right angles.

Where metal sashes and large and heavy plate glass panels are employed either in

stationarily mounted store front sashes, or in sliding sashes, or hinged sashes, difficulty has been heretofore encountered in distributing the engaging pressure between the metal sash sections and the glass panel so as to support the glass panel therein without danger of fracturing the glass, due to excessive localized pressure, and also so as to present uniform contact between the sash and glass, and therefore a workmanlike appearance. Another difficulty was to provide mitered joints at the corners of the sash of true and workmanlike appearance. These several difficulties are obviated in my improved structure.

The accompanying drawings illustrate modifications of my invention, in Figs. 1 to 5 of which, 15, 16, 17, 18, 19, 20, 21, 22, and 23 represent glass panels of a store front, which are all mounted by means of metal sashes relative to the main frame 24 of the store front. A cross rail 25 divides the main frame 24 into an upper and lower section. In the upper section are the glass panels 19, 20 and 21, in substantially one plane and mounted in a single or multiple metal sash 26 as may be preferred.

Below the cross rail 25 is a centrally located door frame 27, which is set back or out of the same plane as the panels 15 and 16. Between the door frame and the inner edges of the panels 15 and 16 are located the panels 17 and 18, which may be mounted at an obtuse angle relative to the panels 15 and 16, substantially as shown in Fig. 2, or may be mounted at substantially right angles to the panels 15 and 16 substantially as shown in Fig. 6. The transom panel 22 is mounted in a metal sash 29, which is hinged to and adjustable relative to the door frame. The panel 23 is mounted by means of a metal sash 30 relative to the door 31 to move with the door.

The metal sash is preferably constructed by cutting and mitering sections of suitable

length from extruded metal bars of special cross-sectional design constructed and carried in stock for this particular purpose. As illustrated in Figs. 2 to 5, angle plates or facing plates 32 and 33 of extruded metal, preferably of ornamental design are rigidly attached to the faces respectively of the structural iron main frame 24, door frame 27, and at top and bottom to the cross bar 25, and a bottom rail not shown, or to other top and bottom supports, depending upon the location of the stationary sash. An annular metal sash member 34 constructed of mitered sections of substantially the cross sectional pattern shown in Fig. 2, and which may be either bent or mitered to form the angles at 35 are set rigidly in place relative to the frame members 32 and 33. The frame 34 is bisected at the angle 35 by a vertical metal bar 36 of substantially the cross sectional pattern shown in Fig. 2.

An annular metal sash section 37 of substantially the cross sectional pattern shown in Fig. 2 and bisected at the angle 35 by a vertical metal bar 38 of substantially the cross sectional pattern shown in Fig. 2, is constructed from mitered sections cut from bars of extruded metal carried in stock for the purpose. The sash section 37 is detachably and removably mounted relative to the rigidly mounted sash section 34 to facilitate the insertion, removal, and adjustment of the glass panels 15 and 16 into place.

In adjusting the detachable sash section 37 relative to the glass panel and the stationary or main sash section 34, since the glass panel is usually plate glass and hence has its opposite faces ground to parallel planes, it is desirable to adjust the edge 40 of sash section 37 into a plane parallel with the face of the glass panel or into planes parallel with the respective glass panels in order to exert a substantially uniformly distributed contact pressure along the face 40 between the sash section 37 and the face of the glass panel. In order to permit and insure such adjustment of the sash section 37 relative to the section 34 and the glass panel, a rib 41 is formed preferably integral with the section 34, and a series of screws 42 are threaded into perforations through said rib 41 at spaced intervals. The screws 42 are adjustable endwise relative to the rib 41 to form a series of adjustable supports for the edge 43 of the sash section 37, thereby enabling the edge 43 to be spaced nearer to or further from the rib 41, depending upon the thickness of the glass panel, until the edge 40 of section 37 lies in a plane parallel to the face of the glass panel and comes substantially simultaneously into contact with the face of the glass panel at all points along the edge 40, and so as to exert a substantially uniform pressure and strain between the edge 40 and the face of the glass panel. The opposite face of the

glass panel engages the edge 45 of the sash section 34 opposite to the edge 40 of the section 37. A close metal to glass joint is thus formed entirely encircling the glass panel, and avoiding the use of any rubber or other interposed soft gasket or packing material, which besides being expensive to provide and install, is unreliable to resist the severe wind, temperature and other strains to which the panels and sashes are subjected. After the screws 42 have been adjusted to bring the face 40 flush with the face of the glass panel, a series of spaced screws 46 are employed to draw and clamp the two sash sections together so as to hold the edge 43 in contact with the heads of the spacing screws 42, and so as to clamp the glass panel between the edges 40 and 45.

As illustrated the screws 46 are threaded into short sections 54 cut from bars of extruded metal of special cross sectional pattern, and which are interlocked and guided endwise of the sections 34 by means of suitable ribs or guides, as for instance the ribs 41 and 51. As illustrated in Fig. 2 the screws 42 are employed to hold the blocks 54 in place as well as to space the sections 37 relative to the sections 34. Separate screws may however be employed to space the blocks 54 along the sections 34. The screws 46 are tapped into the blocks 54 and serve to clamp the sections 34 and 37 together from the exterior of the sash. Where it is desired to clamp the sections 34 and 37 together from the inside of the sash a series of blocks 55 cut from bars of extruded metal may be employed in place of the blocks 54, and screws 56, adjustable from the inside and tapped into the blocks 55 may be employed in place of the screws 46. The blocks 54 are provided with dovetailed channels into which are fitted short sections of leather, wood, soft rubber or similar material 83 adapted to engage the edge of the glass panel to support the weight of the panel along the lower edge of the sash or to position the panel by supporting its side edges.

Where two or more glass panels are mounted in one sash, either in one plane as shown in mounting the panels 19, 20 and 21, or where the glass panels are located in different planes as shown in mounting the panels 15 and 17, I preferably employ a metal cross rail 36 stationarily attached at opposite ends to opposite sides of the sash section 34, and a metal cross rail 38 stationarily attached at opposite ends to opposite sides of the sash section 37. Said cross rails 36 and 38 are of extruded metal of special cross sectional design, and are adapted to be cut from bars especially provided for the purpose and carried in stock. Each of said rails 36 and 38 is provided with ribs 52 projecting inwardly and forming between them a dovetailed channel 57. Short blocks or sections 58, cut from

bars of extruded metal are adapted to engage one of said dovetailed channels 57, and to slide endwise therein and to have its opposite edge guided by the opposite channel 57. 5 Screws 60 tapped into the blocks 58 and passed through perforations in one of the cross bars 36 and 38, serve to clamp the bars 36 and 38 upon opposite faces of the glass panels to form tight joints therewith. As 10 illustrated in Fig. 2, the two glass panels 15 and 17 are shown at an obtuse angle one to the other, and held in relative position by the cross bars 36 and 38. As illustrated in Fig. 5, the panels 19 and 20 for instance, are held in substantially one plane by means of cross 15 bars 64 and 65, corresponding to the cross bars 36 and 38 of Fig. 2. In the modification Fig. 6, glass panels 67, 68 and 69, corresponding to the panels 15 and 17 of Fig. 2, are held at substantially right angles by means of cross 20 bars 70, 71 and 72 and 73, corresponding to the cross bars 36 and 38 of Fig. 2. If desired my improved metal window sashes may be mounted in pairs in window frames to slide 25 vertically in guide channels in the window frame. As shown the ribs 52 and blocks 58 are shaped to prevent spreading the ribs 52 apart by strain applied to blocks 58.

The apparatus herein shown and described 30 is capable of considerable modification within the scope of the claims without departing from the spirit of my invention.

What I claim is:

1. A metal window sash comprising a first 35 annular sash section having a ledge near its inner edge to engage one face of a panel, a second annular sash section having a ledge near its inner edge to engage the opposite face of said panel to clamp the panel between 40 said ledges, means interposed between said sash sections serving as an adjustable fulcrum between said sash sections, and clamping means adjustable to relatively lock said sash sections upon said fulcrum support to 45 clamp the ledges of said respective sash sections upon opposite sides of said panel.

2. A metal window sash comprising a first 50 annular sash section having an annular ledge near its inner edge adapted to engage one face of a panel, a second annular sash section having an annular ledge near its inner edge adapted to engage the opposite face of said panel, a sectional and sectionally adjustable 55 substantially annular fulcrum to support one of said sash sections relative to the opposite sash section, and a substantially annular clamping means serving to draw the ledges of said sash sections toward each other to clamp said panel between said ledges. 60

3. A metal window sash comprising a first 65 annular sash section having an annular ledge near its inner edge adapted to engage one face of a panel, a second annular sash section having an annular ledge near its inner edge adapted to engage the opposite face of said

panel, means sectionally adjustable to support and fulcrum the outer edge of one of said sash sections relative to the opposite sash section, and clamping means interposed 70 between the outer and inner edges of said sash sections adapted to clamp said sash sections together.

4. A metal window sash comprising a first 75 annular sash section having an annular ledge near its inner edge adapted to engage one face of a panel, a second annular sash section having an annular ledge near its inner edge adapted to engage the opposite face of said panel, means adjustable relative to one of 80 said sash sections to support and fulcrum the outer edge of one of said sash sections relative to the opposite sash section, and clamping means interposed between the outer and inner edges of said sash sections adapted to 85 clamp said sash sections together.

5. A metal window sash comprising a first 85 annular sash section having an annular ledge near its inner edge adapted to engage one face of a panel, a second annular sash section having an annular ledge near its inner edge 90 adapted to engage the opposite face of said panel, means adjustable relative to one of said sash sections to support and fulcrum the outer edge of one of said sash sections relative 95 to the opposite sash section, and clamping means interposed between the outer and inner edges of said sash sections adapted to clamp said sash sections together, guideways formed 100 between said sash sections, and blocks located between said sash sections and guided endwise along said guideways and serving as edge supports for said panel.

6. A metal window sash comprising a first 105 annular sash section having an annular ledge near its inner edge adapted to engage one face of a panel, a second annular sash section having an annular ledge near its inner edge adapted to engage the opposite face of said 110 panel, means adjustable relative to one of said sash sections to support and fulcrum the outer edge of one of said sash sections relative to the opposite sash section, and clamping means interposed between the outer and inner edges 115 of said sash sections adapted to clamp said sash sections together, guideways formed on the inside of one of said sash sections, spaced blocks movable endwise along and in engagement with said guideways, and means to clamp said blocks to the opposite sash section.

7. A metal window sash comprising a first 120 annular sash section having an annular ledge near its inner edge adapted to engage one face of a panel, a second annular sash section having an annular ledge near its inner edge adapted to engage the opposite face of said 125 panel, means to support and fulcrum the outer edge of one of said sash sections relative to the opposite sash section, guideways formed on the inside of one of said sash sections, spaced 130 blocks movable endwise along and in engage-

ment with said guideways, and means to clamp said blocks to the opposite sash section to thereby clamp the ledges of said sash sections upon opposite faces of said panel.

8. A metal window sash comprising a first annular sash section having an intersecting cross bar, a second annular sash section having an intersecting cross bar substantially opposite the cross bar of said first sash section, said sash sections and said cross bars each having panel engaging faces adapted to support and engage one panel located upon one side of said cross bars and another panel located upon the opposite side of said cross-bars, one of said sash sections having a fulcrum support to be engaged by the opposite sash section, means to clamp said sash sections together intermediate of said fulcrum support and said panel engaging face, and means to clamp said cross bars together intermediate of the adjacent edges of said panels.

9. A metal window sash comprising a first annular sash section having an intersecting cross bar, a second annular sash section having an intersecting cross bar substantially opposite the cross bar of said first sash section, said sash sections and said cross bars each having panel engaging faces adapted to support and engage one panel located upon one side of said cross bars and another panel located upon the opposite side of said cross-bars, one of said sash sections having a fulcrum support to be engaged by the opposite sash section, means to clamp said sash sections together intermediate of said fulcrum support and said panel engaging face, and guideways longitudinally of one of said cross-bars, blocks spaced along and in engagement with said guideways, and means to clamp said blocks to the opposite of said cross-bars to clamp the edges of said respective panels between said cross-bars.

10. A metal window sash comprising a first annular sash section of angular pattern having an intersecting cross-bar located at the angle therein, a second annular sash section of angular pattern having an intersecting cross-bar at the angle therein and opposite the cross-bar of said first sash section, said sash sections being adapted to support a plurality of panels at relatively different angles, a fulcrum supporting member carried by one of said sash sections adapted to be engaged by the opposite sash section, means to clamp said sash sections together upon the opposite faces of said panels, and means to clamp said cross-bars together intermediate of the adjacent edges of said panels.

11. A metal window sash comprising a first annular sash section having a ledge near its inner edge to engage one face of a panel, a second annular sash section having a ledge near its inner edge to engage the opposite face of said panel to clamp the panel between said ledges, means interposed between said sash

sections and serving as a sectional and sectionally adjustable fulcrum between said sash sections, and clamping means adjustable to relatively lock said sash sections upon said fulcrum support to clamp the ledges of said respective sash sections upon opposite sides of said panel.

In testimony whereof I have affixed my signature.

FRANK L. MICHAELS.